

WHAT IS CLAIMED IS:

1. A device for detecting photons of a light beam (1) emanating from a spatially limited source (2), in particular for use in a fluorescence microscope, comprising a detection device,
wherein the detection device includes at least two detectors (7), and a component (3) capable of splitting the light beam (1) in a way that distributes the photons over the detectors (7) for purposes of detection, is provided in the path of rays of the light beam (1).
2. The device as recited in claim 1,
wherein the detectors (7) are suited for detecting single photons (single photon counting).
3. The device as recited in claim 1 or 2,
wherein the detectors (7) are avalanche photodiodes (APD), photomultipliers and/or EMCCDs (electron multiplying CCDs).
4. The device as recited in one of claims 1 through 3,
wherein the detectors (7) form a one-, two-, or three-dimensional array (6, 9).
5. The device as recited in claim 4,
wherein the three-dimensional array is constituted of semitranslucent EMCCDs disposed one behind the other.
6. The device as recited in one of claims 1 through 5,
wherein the component (3) splits the light beam (1), statistically distributing the photons, preferably in a defocusing process.
7. The device as recited in claim 6,
wherein the component (3) is a cylindrical lens (4).

8. The device as recited in one of claims 1 through 5,
wherein the component (3) splits the light beam (1), spectrally distributing the photons.
9. The device as recited in claim 8,
wherein the component (3) is a prism (8).
10. The device as recited in one of claims 1 through 5,
wherein the component (3) is an electrooptical element or an electromechanical scanner.
11. The device as recited in one of claims 1 through 10,
wherein a plurality of components (3) are positioned in the path of rays of the light beam (1).
12. The device as recited in one of claims 1 through 11,
wherein an electronic counter (12) for counting photons is placed close to the detector (7), in particular on the chip of an EMCCD.
13. The device as recited in one of claims 1 through 12,
wherein a counting logic for counting photons is programmed into an FPGA (field programmable gate array)
14. The device as recited in claim 12 or 13,
wherein an adder (14) is provided upstream and/or downstream of the counter (12).
15. The device as recited in one of claims 1 through 14,
wherein the associated electronics has a monolithic design.